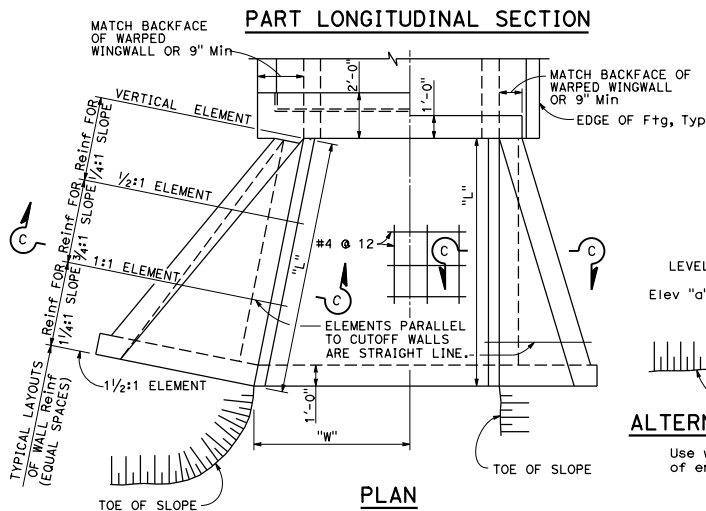
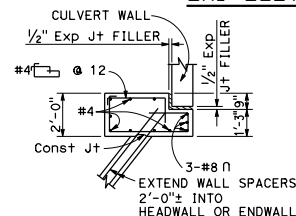


END ELEVATION

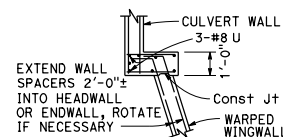


ALTERNATIVE WARPED WINGWALL

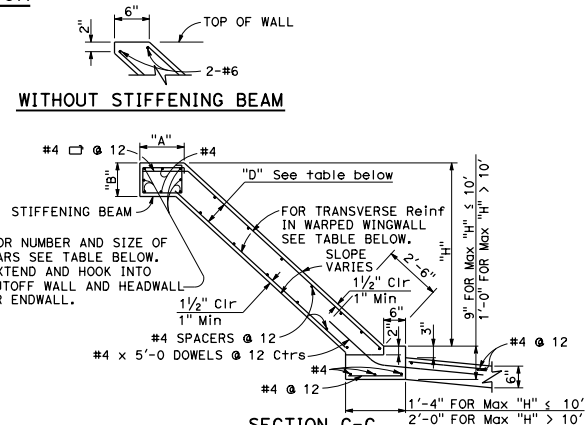
Use where additional protection to toe of embankment is required.



SECTION A-A



SECTION B-B



SECTION C-C

Where abrasion is anticipated, increase apron thickness to 7" minimum to provide 2" minimum reinforcement coverage.

WALL DIMENSIONS AND REINFORCING										STIFFENING BEAM DIMENSIONS AND REINFORCING											
ELEMENT SLOPE	"H"	8' OR LESS	10'	12'	14'	16'	18'	20'	"L" "L" WOOD	12'	14'	16'	18'	20'	25'	30'	35'	40'			
1/4:1	FRONT FACE Reinf	#4 @ 12	#4 @ 7	#5 @ 7	#5 @ 5	#6 @ 6	#7 @ 7	#7 @ 6	6'	NO BEAM, PLACE 2-#6 IN EACH FACE ALONG TOP OF WALL.											
	REAR FACE Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12		8'											
3/4:1	FRONT FACE Reinf	#4 @ 12	#4 @ 12	#4 @ 8	#4 @ 8	#4 @ 8	#4 @ 6	#4 @ 6	10'												
	REAR FACE Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 10	#4 @ 7	#4 @ 6	#5 @ 8		12'									"B"= 9"	"A"= 1'-6"	
1 1/4:1	FRONT FACE Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	14'												
	REAR FACE Reinf	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12		16'											
										TOTAL 6-#6								"B"= 1'-0"	"B"= 1'-3"	"A"= 2'-2"	"B"= 1'-6"
"D" AT CUTOFF WALL	6"	6"	6"	7 1/2"	8"	9 1/2"	11"	11"	18'	TOTAL 6-#7								TOTAL 8-#8	TOTAL 8-#9		
"D" AT CULVERT	6"	6"	6"	8"	9 1/2"	11"	11"	11"	20'												

NOTES:

Walls designed for 2'-0" surcharge; earth density = 120 pcf; equivalent fluid pressure = 36 pcf.
 Vary "D" of warped wall uniformly from that at cutoff wall to that at headwall or endwall, for maximum "H" > 12'.
 Dimensions "L", "W", "H", "M", "N", Elev "d", "Angle of flare", and "Slope" (as applicable) are shown on the plans.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ARCH CULVERT HEADWALLS, ENDWALLS AND WARPED WINGWALLS

NO SCALE

D86C